

**505-41-31**

**EOSDIS Core System Project**

**Interface Control Document  
Between EOSDIS Core System (ECS)  
and the NASA Science Internet (NSI)**

**September 1996**



National Aeronautics and  
Space Administration

**GODDARD SPACE FLIGHT CENTER**  
**GREENBELT, MARYLAND**

INTERFACE CONTROL DOCUMENT  
between the  
EOSDIS Core System (ECS) and the  
NASA Science Internet (NSI)

Reviewed by

\_\_\_\_\_  
Richard desJardins  
System Engineer  
GSFC - Code 505

\_\_\_\_\_  
Date

\_\_\_\_\_  
Mark Turner  
NISN Engineer - ARC

\_\_\_\_\_  
Date

CH01

\_\_\_\_\_  
Candace Carlisle  
Interface Manager  
GSFC - Code 505

\_\_\_\_\_  
Date

Concurrence by:

\_\_\_\_\_  
Gerald R. Zgonc  
EOS NISN Service Manager  
GSFC - Code 542

\_\_\_\_\_  
Date

\_\_\_\_\_  
Dawn Lowe  
ECS Development Manager  
GSFC - Code 423

\_\_\_\_\_  
Date

CH01

\_\_\_\_\_  
Gordon Knoble  
ESDIS Networks Manager  
GSFC - Code 505

\_\_\_\_\_  
Date

Approved by:

\_\_\_\_\_  
Richard A. Helmick  
NISN Project Manager - MSFC

\_\_\_\_\_  
Date

\_\_\_\_\_  
Arthur F. Obenschain  
ESDIS Project Manager  
GSFC - Code 423

\_\_\_\_\_  
Date

CH01

GODDARD SPACE FLIGHT CENTER  
GREENBELT, MARYLAND

## Preface

---

This document is a formal contract deliverable with an approval code 1. It requires Government review and approval prior to acceptance and use. This document is under ECS contractor configuration control. Once this document is approved, Contractor approved changes are handled in accordance with Class I and Class II change control requirements described in the EOS Configuration Management Plan, and changes to this document shall be made by document change notice (DCN) or by complete revision.

Any questions should be addressed to:

Configuration Management Office  
Code 505  
The ESDIS Project Office  
Goddard Space Flight Center  
Greenbelt, MD 20771

This page intentionally left blank.

## Abstract

---

This Interface Control Document (ICD) defines the functional and physical design of each interface between ECS and the NSI, and in its final form will include the precise data contents and format for each interface. All modes (options) of data exchange for each interface will be described as well as the conditions required for each mode or option. The sequence of exchanges will be completely described. Communications protocols will be detailed for each interface.

This ICD is consistent with the ECS-NSI interface requirements, as described in the Earth Science Data and Information System (ESDIS) Project -- Level 2 Requirements, the Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Level 3 requirements, and the Interface Requirements Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI).

**Keywords:** TCP/IP, routing, fault, performance, security, management, SCFs, interface, e-mail, RIP

This page intentionally left blank.



This page intentionally left blank.

## List of Affected Pages

Page No.	Revision	Page No.	Revision	Page No.	Revision	Page No.	Revision
Title	Original	4-4	Original				
i	CH01	4-5	Original				
ii	CH01	4-6	Original				
iii	Original	4-7	Original				
iv	Original	4-8	Original				
v	Original	A-1	Original				
vi	Original	A-2	Original				
vii	CH02	A-3	Original				
viii	Original	A-4	CH02				
ix	CH02	AB-1	Original				
x	Original	AB-2	Original				
xi	Original						
xii	Original						
1-1	Original						
1-2	Original						
2-1	Original						
2-2	Original						
3-1	Original						
3-2	Original						
3-3	Original						
3-4	Original						
4-1	Original						
4-2	Original						
4-3	Original						

This page intentionally left blank.

# Contents

---

## 1. Introduction

1.1	Identification .....	1-1
1.2	Scope.....	1-1
1.3	Purpose and Objectives.....	1-1
1.4	Status and Schedule .....	1-1

## 2. Related Documentation

2.1	Parent Documents .....	2-1
2.2	Applicable Documents.....	2-1
2.3	Information Documents .....	2-1

## 3. Interface Overview

3.1	Systems Relationship Overview .....	3-1
3.2	EOSDIS Core System (ECS) Description .....	3-3
3.2.1	ECS Overview.....	3-3
3.2.2	ECS Segments.....	3-3
3.3	NSI Description.....	3-4

## 4. Data Flow Descriptions

4.1	General Information.....	4-1
4.2	ECS-NSI Network Services.....	4-1
4.2.1	Physical Topology and Demarcation Points .....	4-1
4.2.2	Network Protocols.....	4-6
4.3	ECS-NSI Network Management.....	4-7
4.3.1	Fault Management.....	4-7

4.3.2	Performance Management .....	4-8
4.3.3	Security Management .....	4-8

## **Figures**

3.1-1.	Interface between Users, ECS, and NSI .....	3-1
3.1-2.	ECS-NSI Management Interface .....	3-2
4.2.1.1-1.	ECS-NSI Interface at GSFC for Release A .....	4-2
4.2.1.1-2.	ECS-NSI Interface at GSFC for Release B.....	4-2
4.2.1.2-1.	ECS-NSI Interface at LaRC for Releases A and B.....	4-3
4.2.1.3-1.	ECS-NSI Interface at EDC for Release A .....	4-4
4.2.1.3-2.	ECS-NSI Interface at EDC for Release B.....	4-4
4.2.1.4-1.	ECS-NSI Interface at JPL for Release B .....	4-5
4.2.1.5-1.	ECS-NSI Interface at NSIDC for Release B.....	4-5
4.2.1.6-1.	ECS-NSI Interface at ASF for Release B .....	4-6

## **Appendix A. NSI-ECS Event Notifications**

### **Abbreviations and Acronyms**

# 1. Introduction

---

## 1.1 Identification

This Interface Control Document (ICD), Contract Data Requirement List (CDRL) item 029, whose requirements are specified in Data Item Description (DID) 209/SE2, is a required deliverable under the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000).

## 1.2 Scope

This ICD defines the system interfaces that exist between ECS and the NSI in the ECS Release A and Release B timeframes. Unless otherwise stated, the information in this ICD is applicable to both releases.

The Earth Science Data and Information System (ESDIS) Project has joint responsibility with the NSI project for the development and maintenance of ICD sections that are relevant to the NSI interface. Any changes in the interface definition must be agreed to by the relevant participating parties, and then assessed at the ESDIS Project Level. This ICD will be approved under the signature of the ESDIS Project Manager and NSI.

This document reflects the technical baseline maintained by the ECS Configuration Control Board in accordance with ECS technical direction (see Section 2.2).

## 1.3 Purpose and Objectives

This ICD defines the unique interfaces between ECS and the NSI as derived from the Level 3 requirements specified in the Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System and the Interface Requirements Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI). This document is written to formalize the interpretation and general understanding of the interface between ECS and the NSI. This document also provides clarification and elaboration of the ECS-NSI interfaces to the extent necessary to assure hardware, software, and operational service compatibility within the end-to-end system. This ICD provides a control point for definition of external interfaces between ECS and the NSI.

## 1.4 Status and Schedule

Preliminary ICDs are defined as functional ICDs that may include TBDs. Final ICDs are defined as detailed ICDs that should be free of TBDs. This document is a final ICD for ECS-NSI interfaces that will be implemented in ECS Releases A and B.

This page intentionally left blank.

## 2. Related Documentation

---

### 2.1 Parent Documents

The following documents are the parents from which this document's scope and content derive:

193-208-SE1-001	Methodology for Definition of External Interfaces for the ECS Project
301-CD-002-003	System Implementation Plan for the ECS Project
423-10-01-0	Goddard Space Flight Center, Earth Science Data and Information System (ESDIS) Project -- Level 2 Requirements, Volume 0, February 18, 1993
423-10-01-1	Goddard Space Flight Center, Earth Science Data and Information System (ESDIS) Project -- Level 2 Requirements, Volume 1, January 27, 1993
423-41-01	Goddard Space Flight Center, EOSDIS Core System Statement of Work, May 21, 1993
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System, May 21, 1993
505-41-17	Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI), 10/95

### 2.2 Applicable Documents

The following documents are referenced herein and are directly applicable to this document. In the event of conflict between any of these documents and this document, this document shall take precedence.

223-CD-001-001	ECS External Traffic Requirements
210-TP-001-006	Technical Baseline for the ECS Project
none	Goddard Space Flight Center, ECS Technical Direction No. 11, "PDR Technical Baseline," 12/6/94

### 2.3 Information Documents

The following documents, although not directly applicable, amplify or clarify the information presented in this document, but are not binding.

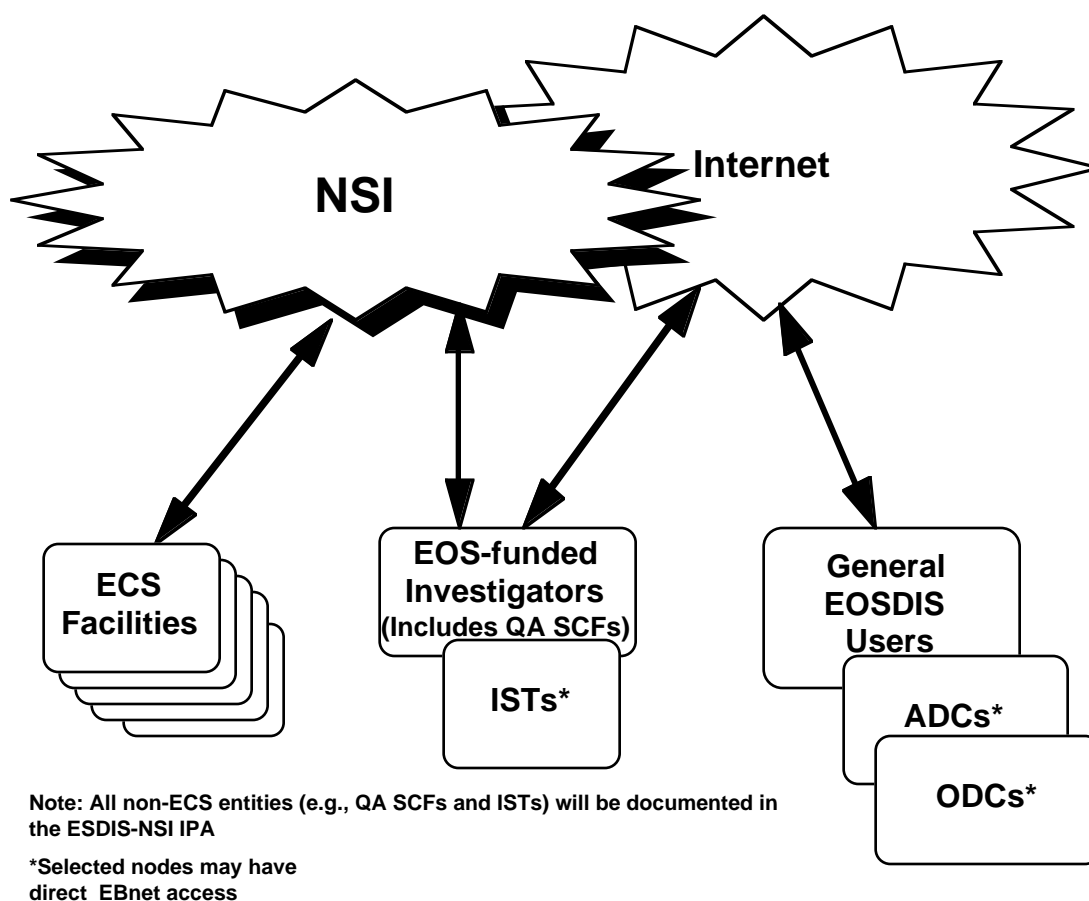
RFC 768	Postel, J.; User Datagram Protocol
---------	------------------------------------

RFC 793	Postel, J.; Transmission Control Protocol
RFC 1058	C. Hedrick; Routing Information Protocol
RFC 1564	Y. Rekhter; Border Gateway Protocol 4 (BGP-4)

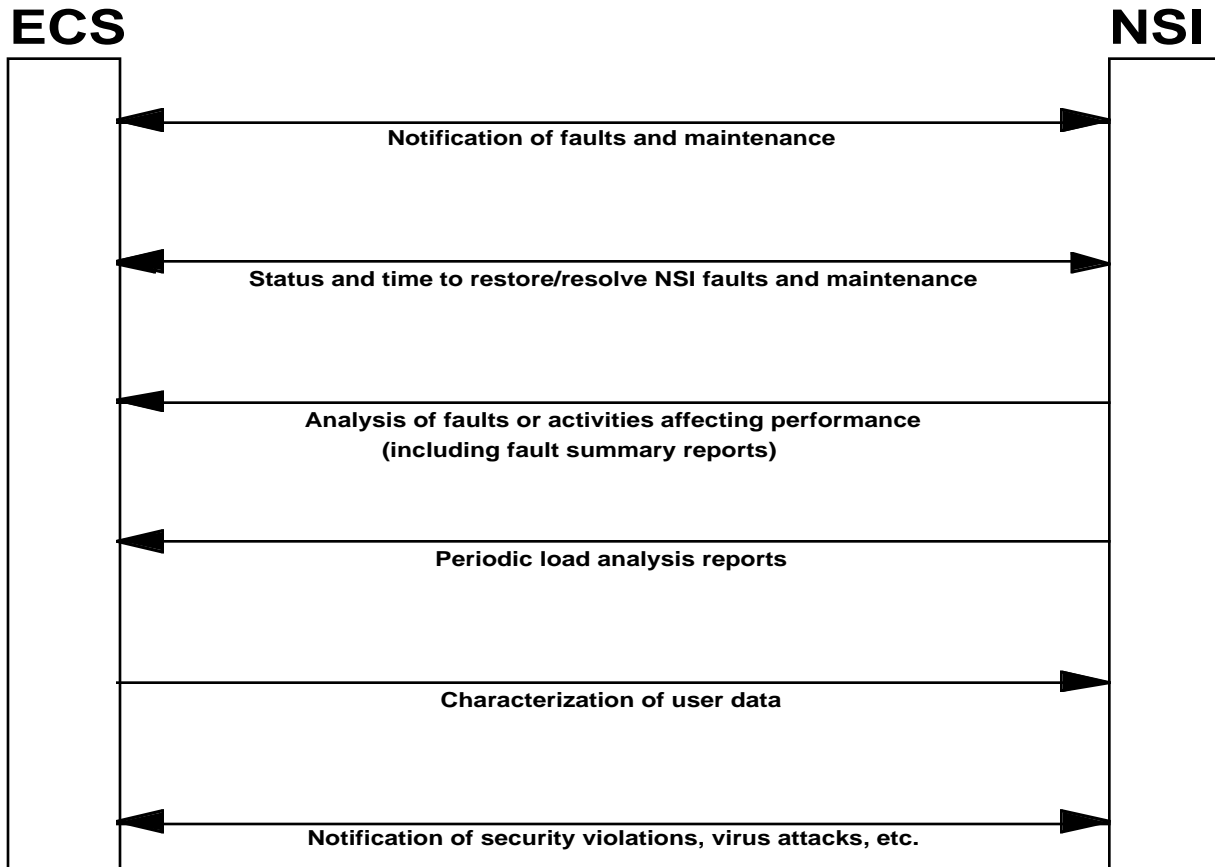
## 3. Interface Overview

### 3.1 Systems Relationship Overview

The ECS and the NSI will work in coordination to perform interchange between external Wide Area Networks. NSI is used to make data available from ECS facilities to EOSDIS users, including EOS project funded investigators (such as SCFs, QA SCFs, and ISTs), non-EOS affiliated scientists and researchers, and the research community at large (including academia and industry). Figure 3.1-1 depicts the interface between ECS, NSI and users, and Figure 3.1-2 depicts the management interface between ECS and NSI.



**Figure 3.1-1. Interface between Users, ECS, and NSI**



**Figure 3.1-2. ECS-NSI Management Interface**

The NSI Project Office is responsible for managing the NASA Science Internet, which includes the following activities:

- a. Engineering the network (e.g., backbone, tail circuits, internal routers, etc.)
- b. Scheduling installation of new network services and backbone upgrades based on customer (ESDIS and others) requirements.
- c. Network performance monitoring
- d. Network capacity planning
- e. Fault and error detection, isolation and fault resolution.

Hughes Information Technology Systems (HITS) is responsible for system management of the ECS (e.g., System Management and Coordination facility (SMC), ECS Development Facility (EDF), etc.), while ESDIS is responsible for providing prioritized external network requirements for ECS to NSI.

Sections 3.2 and 3.3 provide overall views of the ECS and the NSI to form a basis for understanding the interface requirements between them.

## **3.2 EOSDIS Core System (ECS) Description**

### **3.2.1 ECS Overview**

The ECS, the EOS Data and Operations System (EDOS), and the EOSDIS Backbone Network (EBnet) are components of the EOSDIS. ECS supports the planning, scheduling, and control of U.S. EOS spacecraft and instruments. In addition to fully supporting the EOS series, the ECS provides information management and data archive and distribution functions for all other NASA Earth science flight missions, NASA instruments flown on non-NASA flight missions, and for other NASA held Earth science data.

### **3.2.2 ECS Segments**

ECS is composed of three segments defined to support three major operational areas: flight operations, science data processing, and communications/system management. The ECS segments are described below.

#### **3.2.2.1 Flight Operations Segment**

The Flight Operations Segment (FOS) manages and controls the EOS spacecraft and instruments. The FOS includes the EOS Operations Center (EOC)/Instrument Control Center (ICC), which is responsible for mission planning, scheduling, control, monitoring, and data analysis in support of mission operations for U.S. EOS spacecraft and instruments. The ECS EOC/ICC is located at the Goddard Space Flight Center (GSFC). The FOS also provides investigator-site ECS software (the Instrument Support Terminal [IST] toolkit) to connect a Principal Investigator (PI) or Team Leader (TL) to the FOS in remote support of instrument control and monitoring. (Investigator facilities are outside the FOS, but connected to it by way of NSI.)

#### **3.2.2.2 Science Data Processing Segment**

The Science Data Processing Segment (SDPS) provides a set of ingest, processing, and distribution services for science data and a data information system for the entire EOSDIS. The SDPS processes data from the EOS instruments to Level 1-4 data products. The SDPS also provides short- and long-term storage for EOS, other Earth observing missions, and other related data, software, and results, and distributes the data to EOSDIS users. The SDPS contains a distributed data and information management function and user services suite for the ECS, including a catalog system in support of user data selection and ordering. The ECS DAACs are composed of both the SDPS and CSMS segments.

### **3.2.2.3 Communications and System Management Segment**

The Communications and System Management Segment (CSMS) provides overall ECS management of ECS ground system resources, provides communications/networking services for an extensive science data communications network, and manages the interfaces to the DAAC-to-DAAC processing network, the Level 0 data providers, and NSI. The CSMS also includes the LANs at each of the DAACs and ECS Operation Center (EOC) to support ECS operations; connection to International Partners (IPs); and interfaces at DAACs with Nascom, and NSI. The CSMS System Monitoring and Coordination facility, along with local system management capabilities at DAAC sites and the EOC, provides system management services for ECS ground system resources. Most of the operations staff is considered part of SDPS or FOS, including Local System Management (LSM) operators. The ECS DAACs are composed of both the SDPS and CSMS segments.

## **3.3 NSI Description**

The NASA Science Internet (NSI) is an open computer communications network that serves the needs of NASA's diverse science and research community worldwide. NSI's mission is to demonstrate leadership in fulfilling NASA's scientific goals and objectives by providing reliable, global network communications for scientific research. It accomplishes its mission by identifying and managing all existing and future NASA science network requirements, engineering high quality solutions in a rapid and cost-effective manner, providing and maintaining a trouble-free network in a dynamically evolving environment, developing tools to enhance the usefulness of the network, and providing information on how to find and use networking resources.

NSI was established in 1988. In 1989, both the DECnet-based Space Physics Analysis Network (SPAN) and the TCP/IP-based NASA Science Network (NSN) were brought together as a single project called NSI. Today NSI is a high-speed, multi-protocol, international network that supports both DECnet and TCP/IP protocols. NSI currently serves nearly 10,000 NASA researchers and collaborators worldwide, with high-performance links and gateways connecting to several thousand research, educational and public commercial networks via the Internet and national research networks in Europe, Asia, and other continents. In the future, NSI will continue to focus its technical expertise and leadership to benefit NASA.

## 4. Data Flow Descriptions

---

### 4.1 General Information

Section 4 describes the data flows between ECS and NSI. Section 4.2 deals with the physical and architectural aspects of the interface, such as points of demarcation and choice of routing protocols. Section 4.3 defines the network management interface, detailing procedures for fault management and notification, as well as performance management. NSI data flow estimates at ECS interfaces are discussed in Section 4 of the ECS External Traffic Requirements Document (223-CD-001-001).

### 4.2 ECS-NSI Network Services

This section defines the architectural aspects of the ECS-NSI interface.

#### 4.2.1 Physical Topology and Demarcation Points

NSI provides Internet access to the following ECS sites:

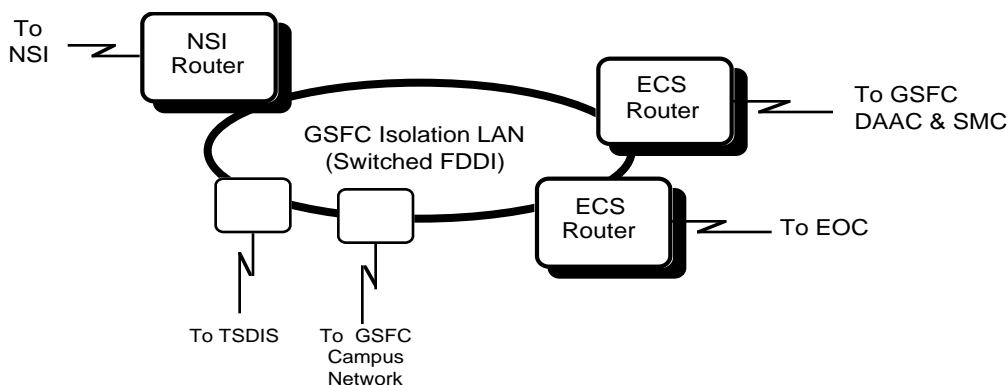
1. ECS at the GSFC DAAC \* (Distributed Active Archive Center), Goddard Space Flight Center (GSFC), Greenbelt, Maryland
2. System Monitoring and Coordination facility \*, Goddard Space Flight Center (GSFC), Greenbelt, Maryland
3. EOS Operations Center (EOC), Goddard Space Flight Center (GSFC), Greenbelt, Maryland
4. ECS at the LaRC DAAC \*, Langley Research Center (LaRC), Hampton, Virginia
5. ECS at the EDC DAAC, Earth Resources Observation System (EROS) Data Center (EDC), Sioux Falls, South Dakota
6. ECS at the JPL DAAC, Jet Propulsion Laboratory (JPL), Pasadena, California (a Release B site)
7. ECS at the NSIDC DAAC, University of Colorado, National Snow and Ice Data Center (NSIDC), Boulder, Colorado (a Release B site)
8. ECS at the ASF DAAC, University of Alaska, Alaska Synthetic Aperture Radar (SAR) Facility (ASF), Fairbanks, Alaska (a Release B site)

Each of the Release A and B interfaces is discussed in more detail in the following subsections.

- \* These sites get NSI service during Releases A and B (the rest of the sites get NSI service during Release B).

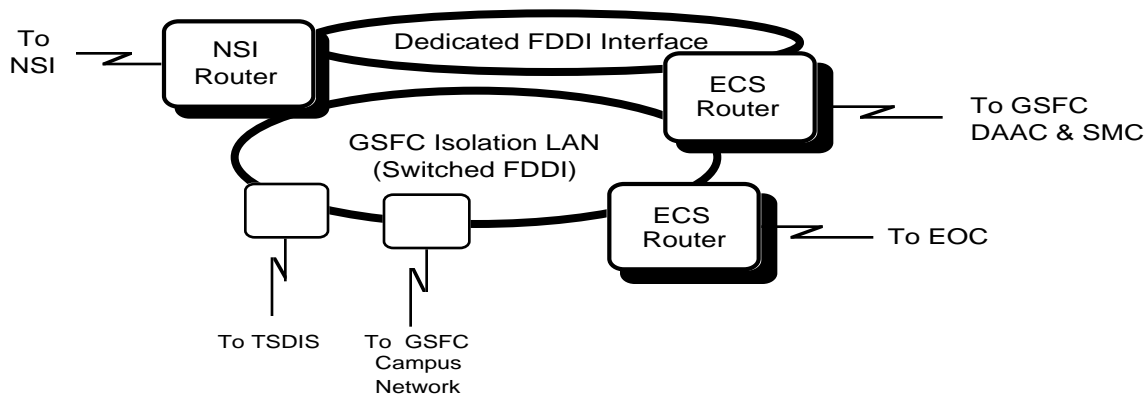
#### 4.2.1.1 GSFC

The Release A interface between ECS and NSI at GSFC will occur via the GSFC Campus Isolation LAN. All traffic between ECS and NSI will flow across this switched-FDDI LAN. ECS will connect to the ISO-LAN in Building 32 via two routers (one providing connectivity to the ECS GSFC DAAC and SMC and the other connecting to the EOC), and NSI will connect to the ISO-LAN in Building 1. This topology is depicted in Figure 4.2.1.1-1. Note that other networks, such as TSDIS (TRMM Science and Data Information System) and the CNE (Center Network Environment), may also connect to the ISO-LAN. The NSI and ECS points of demarcation are at their respective routers connecting to the ISO-LAN.



**Figure 4.2.1.1-1. ECS-NSI Interface at GSFC for Release A**

The only change in the interface for Release B is the addition of a separate FDDI connection between the ECS GSFC DAAC/SMC router and NSI. Both NSI and ECS will continue to connect to the ISO-LAN, but an additional FDDI interface will be in place in order to handle the increase in data flows from the ECS GSFC DAAC to NSI during Release B. This topology is pictured in Figure 4.2.1.1-2 below.

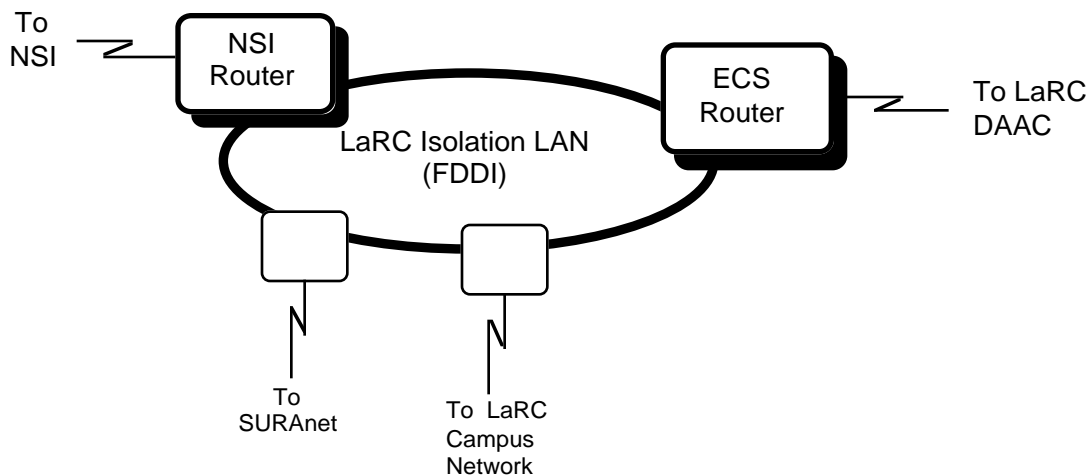


**Figure 4.2.1.1-2. ECS-NSI Interface at GSFC for Release B**

#### 4.2.1.2 LaRC

The Release A and Release B interface between ECS and NSI at LaRC will occur via the LaRC Isolation LAN spanning Buildings 1201 and 1268. All traffic between ECS and NSI will flow across this FDDI-based LAN.

The topology is depicted in Figure 4.2.1.2-1. Note that other networks, such as SURAnet and the LaRC campus network, also connect to this LAN. The NSI and ECS points of demarcation are at their respective routers connecting to the isolation LAN. Note that the interface remains the same for Release B, although it may be necessary, depending on the amount of user pull and the loading on the ISO-LAN, to introduce a second, dedicated FDDI interface directly between ECS and NSI (as in the case of GSFC).

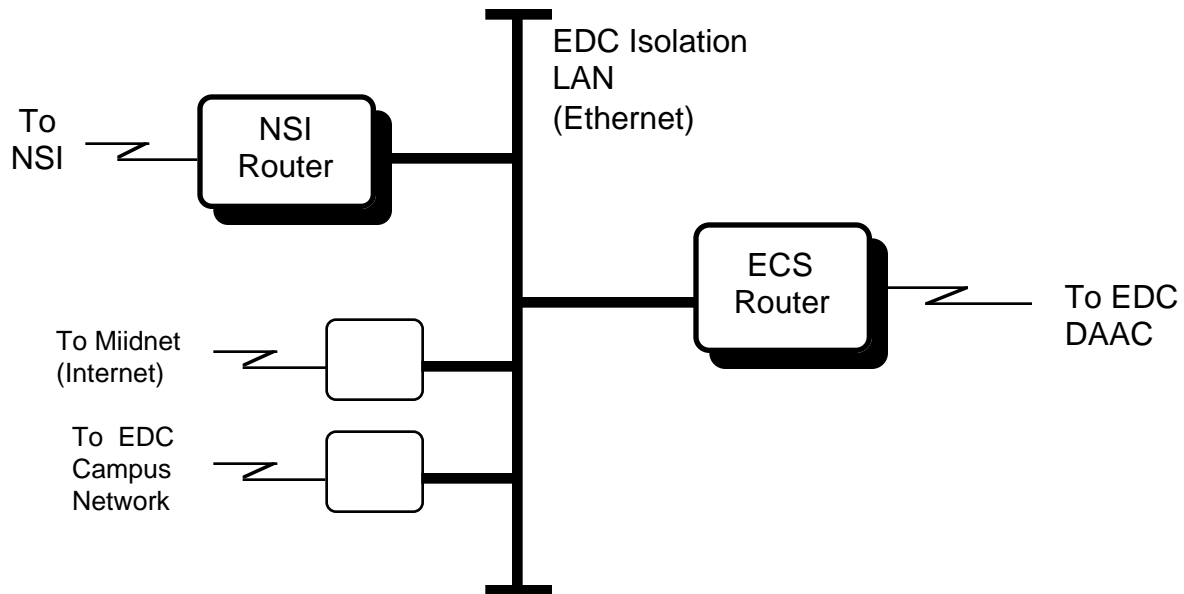


**Figure 4.2.1.2-1. ECS-NSI Interface at LaRC for Releases A and B**

#### 4.2.1.3 EDC

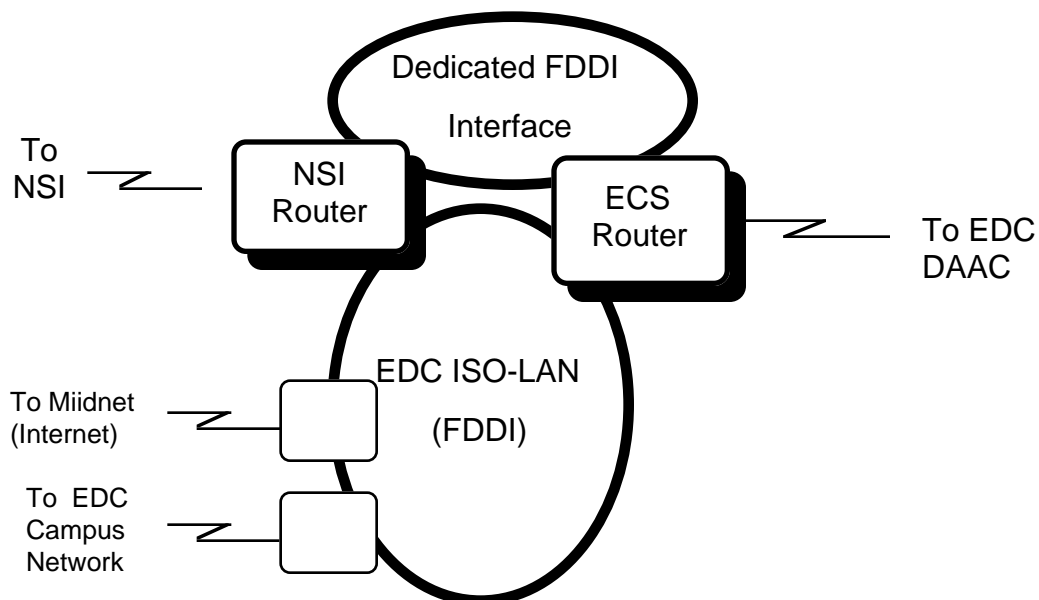
The Release A interface between ECS and NSI at EDC will occur via the EDC Isolation LAN. Traffic between ECS and NSI will flow across this Ethernet-based LAN.

The topology for Release A is depicted in Figure 4.2.1.3-1. Note that other networks, such as Midnet and the EDC campus network, also connect to this LAN. The NSI and ECS points of demarcation are at their respective routers connecting to the isolation LAN.



**Figure 4.2.1.3-1. ECS-NSI Interface at EDC for Release A**

Due to the increase in estimated data volumes from ECS to NSI, an FDDI interface will be required for Release B. The flows are large enough to require a dedicated FDDI link between ECS and NSI, although each will still connect to the EDC ISO-LAN (which is assumed to be FDDI by then).

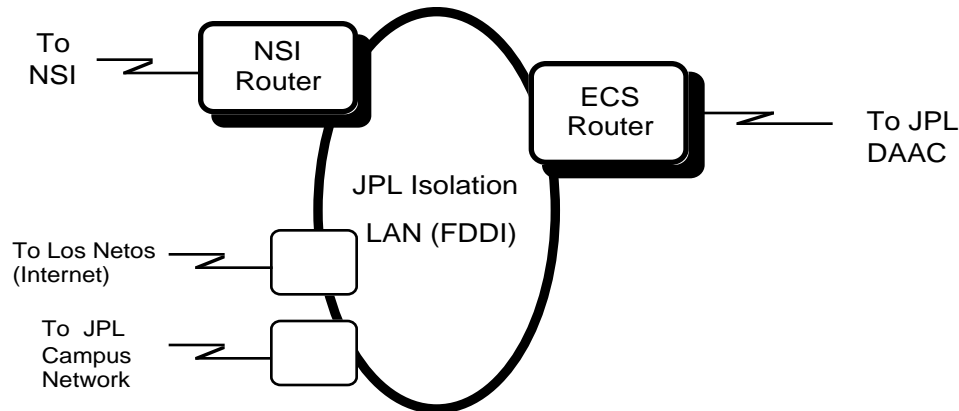


**Figure 4.2.1.3-2. ECS-NSI Interface at EDC for Release B**

#### 4.2.1.4 JPL

There is no ECS component at JPL during Release A.

The ECS-NSI interface for Release B is illustrated in Figure 4.2.1.4-1. Both NSI and ECS will connect to the JPL Isolation LAN. Note that other networks, such as Los Netos and the JPL campus network, also connect to this LAN. The NSI and ECS points of demarcation are at their respective routers connecting to the ISO-LAN.

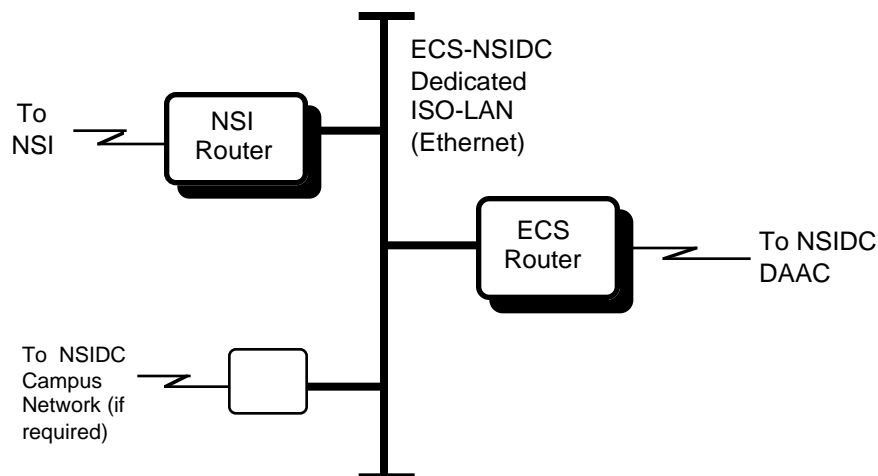


**Figure 4.2.1.4-1. ECS-NSI Interface at JPL for Release B**

#### 4.2.1.5 NSIDC

There is no ECS component at NSIDC during Release A.

The ECS-NSI interface for Release B is illustrated in Figure 4.2.1.5-1. Both NSI and ECS will connect to an Ethernet ISO-LAN. Connectivity to the local NSIDC campus may also be provided through this exchange LAN if such connectivity is required. The NSI and ECS points of demarcation are at their respective routers connecting to the ISO-LAN.

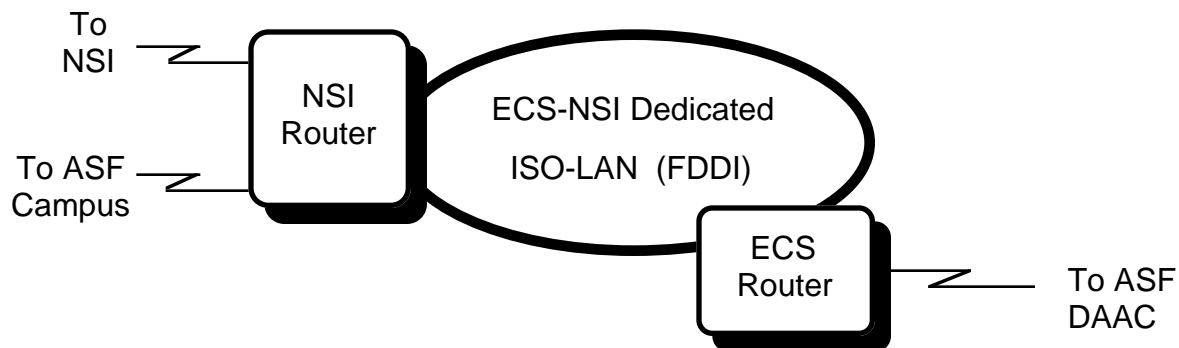


**Figure 4.2.1.5-1. ECS-NSI Interface at NSIDC for Release B**

#### 4.2.1.6 ASF

There is no ECS component at ASF during Release A.

The ECS-NSI interface for Release B is illustrated in Figure 4.2.1.6-1. Both NSI and ECS will connect to an FDDI ISO-LAN dedicated solely for ECS-NSI flows. NSI will also connect to the ASF campus network via a separate interface. The NSI and ECS points of demarcation are at their respective routers connecting to the ISO-LAN.



**Figure 4.2.1.6-1. ECS-NSI Interface at ASF for Release B**

### 4.2.2 Network Protocols

The information contained in this section, and in the remainder of this document, pertains to all ECS-NSI interfaces unless stated otherwise.

#### 4.2.2.1 Internet Protocol (IP)

ECS provides Internet Protocol (IP) based connection-oriented and connectionless transport services. The connection-oriented service is implemented using Transmission Control Protocol (TCP), while User Datagram Protocol (UDP) is used for connectionless transport.

NSI provides a network layer service based on IP and will route all IP-based datagrams, regardless of the higher-layer protocol (such as TCP and UDP). Thus, all ECS-NSI traffic will utilize the IP protocol at the network layer.

#### 4.2.2.2 IP Routing

ECS routers and NSI routers shall dynamically exchange IP routing information through either the Routing Information Protocol (RIP) or the Border Gateway Protocol 4 (BGP-4). The primary routing protocol during Release A at GSFC, LaRC, and EDC between ECS and NSI will be RIP. RIP shall also be used for all sites for Release B.

NSI is the primary internet provider for ECS; therefore, NSI will advertise ECS networks to the Internet. ECS will advertise its entire class C IP network to NSI, who will in turn advertise the entire class C to the rest of the Internet. [Note that internal to the DAACs, ECS will subnet its

class C to create separate networks. This subnetting will be internal to ECS only and will not be advertised to other networks. All ECS DAACs will have their entire class C network advertised to the Internet by NSI.]

## 4.3 ECS-NSI Network Management

### 4.3.1 Fault Management

ECS and NSI are responsible for monitoring their own networks, and for reacting to and correcting problems within their networks. NSI will provide ECS with read-only privileges for the SNMP MIB variables in the "edge" NSI router (i.e., in the NSI router connecting to the isolation or exchange LANs described in section 4.2.1). This enables ECS to verify that ECS-to-NSI traffic reaches NSI. Likewise ECS will provide NSI with read-only privileges for the SNMP MIB variables in the edge ECS routers.

For unplanned failures, NSI shall notify ECS upon detection of any failures within the NSI network that affect ECS sites (e.g., the DAACs, the EOC, and the SMC). NSI will notify the affected ECS site directly (via email, as discussed below) and will also notify the SMC. ECS is then responsible for notifying other sites as necessary (e.g., other DAACs, the EOC, SCFs, and ISTs). NSI's fault notification shall specify the impact of the fault on ECS (e.g., whether a site is completely down, whether a circuit is down but ECS traffic is re-routed over lower-capacity circuits, whether a line is up but is receiving a large number of errors, etc.). ECS will not be notified of faults having no impact on ECS.

NSI's fault notification shall include an estimated time for restoration of service in the Status Log field (see Table A-1). If the estimated time changes during NSI's attempts to resolve the problem, then NSI shall notify ECS of the revised restoration time. ECS does not expect status updates from NSI unless the estimated time of restoration has changed. However, NSI shall always notify ECS upon resolution of the problem.

The format for fault notification from NSI to ECS is via SMTP electronic mail (email) and will be formatted in a machine-parsable form. The template for ECS-NSI Event Notification is illustrated in Figure A-1 located in Appendix A. This template will not be used for advance notifications of scheduled maintenance (see below). Table A-1 shows the ECS-NSI transfer data dictionary. Table A-2 shows the mapping between EOSDIS site names and site IDs used in the dictionary. The operations concept for handling trouble tickets is being developed by the EMC (Enterprise Management Concept) team, and should be referred to for detailed operational concepts.

NSI shall notify the SMC and all affected ECS sites of scheduled maintenance activities (planned failures) by email nominally 5 days in advance (or as information becomes available). The notice will provide an estimated time of restoration. Changes in the estimate will be propagated to ECS through an open trouble ticket once the scheduled activity is underway.

NSI will make available monthly meantime to repair (MTTR) statistics reports for all network faults affecting ECS. The reports will be placed in an anonymous FTP directory and ECS will access the data as needed.

ECS will contact NSI for such reasons as requesting clarification on an NSI fault notification, reporting security violations (which is discussed in more detail below) and notifying NSI of network faults (within a DAAC) that affect end users that access ECS via NSI. Telephone will be the primary means of communication from ECS to NSI and email will be secondary.

#### **4.3.2 Performance Management**

NSI will provide ECS with data reflecting the performance of the NSI network. NSI will make available to ECS weekly online reports of link utilization statistics for NSI's EOSDIS sites, including daily maximum rates for link utilization and errors and average rates over 8 hour intervals. These reports will be placed in an anonymous FTP directory and ECS will access the data as needed.

On a case-by-case basis where the situation warrants the collection of additional performance data, ECS will request that NSI perform intrusive tests of data throughput between specific hosts identified by ECS. Such tests may include hosts not reachable via NSI facilities exclusively, and will typically be activated for periods less than five minutes per hour, over a period of less than one week.

ECS will provide NSI, upon request, data characterizing the traffic patterns and volume associated with ECS user access of data via NSI.

#### **4.3.3 Security Management**

Both NSI and ECS are responsible for monitoring their networks for security violations (such as break-in attempts and computer viruses) and for reporting such violations. Upon detecting a security violation within NSI that may potentially impact ECS, NSI will notify affected ECS sites via email (using NSI's standard escalation procedures). The email notification shall also be sent to the SMC in addition to the affected ECS sites. In an urgent situation, or if using email is inappropriate because of the nature of the security breach, NSI will notify the affected ECS site(s) by telephone. If an affected site can not be reached by telephone, NSI shall notify the SMC via telephone. ECS and NSI shall work together as required to correct the security violation.

ECS shall provide NSI with a unique email address for informing the SMC of security violations. NSI shall post all ECS related security threats or violation to this mail box. NSI shall include "[NSI][SEC]" (without the quotations) as the first ten characters of the Subject field for each security related message. NSI shall provide updates to ECS sites and the SMC to reflect significant changes or new information relating to the event. NSI shall also distribute general security bulletins and information as it deems necessary.

ECS is responsible for informing NSI of any ECS security violations impacting or utilizing the NSI network. ECS will notify the NSI NOC of these violations via telephone, or email using the same subject field format as described above ("[Site ID][SEC]"), as appropriate. (The three character site IDs are identified in Table A-2.)

## Appendix A. NSI-ECS Event Notifications

---

The following figure and tables show the template for ECS-NSI Event Notifications, the schema fields and domain site to domain ID mappings.

Schema: Trouble-Ticket-Xfer

Server:

Login:

Password:

Status !536870912!:

# Values: Open, Closed, Tracking, Information, Rejected

EventDescription !536870913!:

StatusLog !536870919!:

Activity !536870918!:

SourceCreateDate !536870916!:

SourceCloseDate !536870920!:

SourceTicketId !536870914!:

AffectedSites !536870917!:

SourceSiteId !536870921!:

ContactInformation !536870915!:

DestinationSiteId !536870922!:

**Figure A-1. ECS-NSI Event Notification Message Format  
(for Faults and Maintenance)**

**Table A-1. ECS-NSI Event Notification Message Schema Fields  
(for Faults and Maintenance)**

Field Name *	Field ID	Data Type	Size	Values	Defined
Status	536870912	selection		Open, Closed, Tracking, Information, Rejected	Current status of trouble ticket in its source system. Reason for rejection can be found in the StatusLog.
EventDescription	536870913	character	255		Short description of event which is used to present selection lists through the User UI.
SourceTicketId	536870914	character	15		Trouble ticket id from ticket's source system.
ContactInformation	536870915	character	255		Name, phone, fax, etc. of responsible person(s) at source site.
SourceCreateDate	536870916	timestamp			Timestamp when ticket was created in source system. GMT
AffectedSites	536870917	character	255	See Table A-2 for current list of supported sites.	Space separated list of site ids for sites affected by event.
Activity	536870918	character	25		If an outage is determined to be from a planned outage the ticket will be marked as such, otherwise it will be marked unplanned. This field is *NOT* used for scheduling future planned outages.
StatusLog	536870919	Diary	Unlimited		All diagnostic notes and any other information deemed important to the destination site. All related external trouble tickets received against this problem will be included here and marked "\nEOSXID: SourceTicketNumber\n". The reason for rejecting a message is included here as well.
SourceCloseDate	536870920	timestamp			Timestamp of when source system closed their ticket. GMT.
SourceSiteId	536870921	character	30	See table below for current list of supported sites.	Site id of site that sent you this ticket.
DestinationSiteId	536870922	character	30	See table below for current list of supported sites.	Site id of site that you intend to receive this ticket.

\* All fields are required

### **Implementors Notes for Common Schema**

Field: Status

This field may have only one value. The value will be updated as problem is worked. The acceptable values are enumerated in the schema. On any status change, an update of the ticket is sent to relevant organizations (as listed in the AffectedSites field). If ticket is rejected, a rejection notice is sent to the originating organization.

**Field: EventDescription:**

This is a free format field. The intention is to use it to contain a condensed summary of the event. Used by Remedy when displaying a selected list of tickets to provide the user summary information on ticket content.

**Field SourceTicketID:**

This is the ticket number from the originator's system. This field may contain only one value, which may be up to 15 characters in size and must use the unique site identifier prefix as the first three characters of the ticket number. E.g. An EBnet ticket SourceTicketID field could contain EBN#####.

**Field ContactInformation:**

This is a free format field. The intended use is to identify the person having the problem or someone who can discuss the problem at the remote end.

**Field SourceCreateDate:**

This field is in Remedy timestamp format using GMT.

**Field AffectedSites:**

The maximum size of this field is 255 characters. This field must contain only the unique site identifiers. The field may contain multiple site identifiers separated by spaces. The identifiers selected should represent the sites affected by the service problem and will be matched with the appropriate email address for that site by Remedy and used to route the trouble ticket to the affected sites. Values can be added to this field at any time via the picklist.

**Field Activity:**

Acceptable values are "planned" and "unplanned". This field is not used for scheduling preventative maintenance, but will be used after a service problem is identified to describe if the remote site was offline by their own choice.

**Field StatusLog:**

This field is intended to contain the entire record of troubleshooting and problem symptoms. A history of relevant remote troubletickets will be maintained by entries in the log labelled "\nEOSXID: SourceTicketNumber\n". All duplicate tickets received for the same problem will be rejected, but entered into statuslog with EOSXID, and they become an affected site and get added to the "AffectedSite" field. This field is of unlimited size.

**Field SourceClosedDate:**

This field is in Remedy time format using GMT and may contain only a single value.

**Field SourceSiteID:**

This field should contain the unique site identifier of the site originating the ticket. It may contain only one value. This field was included so that there will be no confusion about senders and recipients.

**Field DestinationSiteID:**

This field should contain the unique site identifier of the site originating the ticket. It may contain only one value. This field was included so that there will be no confusion about senders and recipients.

***Table A-2. Site to Site ID Mapping***

<b>EOSDIS Sites</b>	<b>Site IDs</b>
SMC	SMC
EOC	EOC
GSFC	GSF
LaRC	LAR
EDC	EDC
NSIDC	NSC
JPL	JPL
ASF	ASF
ORNL	ORN
ECS EDF	EDF
EDOS	EDO
EBnet	EBN
NSI	NSI
ASTER	AGD

CH02

## Abbreviations and Acronyms

---

AI&T	Algorithm Integration and Test
BGP-4	Border Gateway Protocol - version 4
CCB	Configuration Control Board
CDR	Critical Design Review
CDRL	Contract Data Requirement List
CSCI	computer software configuration item
CSMS	Communications and Systems Management Segment
DAAC	Distributed Active Archive Center
DCN	Document Change Notice
DCE	Distributed Computing Environment
DFS	Distributed File System
DID	Data Item Description
EBnet	EOSDIS Backbone Network
ECS	EOSDIS Core System
EDHS	ECS Data Handling System
email	electronic mail
EOC	ECS Operations Center
EOS	Earth Observing System
EOSDIS	Earth Observing System Data and Information System
ESDIS	Earth Science Data and Information System
FDDI	Fiber Distributed Data Interface
ftp	file transfer protocol
GSFC	Goddard Space Flight Center
HWCI	hardware configuration item
ICD	Interface Control Document
IDR	Incremental Design Review

IP	Internet Protocol
IRD	Interface Requirement Document
KB	kilobytes
LAN	Local Area Network
NSI	NASA Science Internet
RIP	Routing Information Protocol
RFC	Request for Comment
SDP	Science Data Processing
SDPS	Science Data Processing Segment
SMC	System Monitoring and Coordination
TBD	To be determined
TBR	To be reviewed
TBS	To be supplied
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
WAN	Wide Area Network